

In a few cases there are slips which can hardly be assigned to the printer, e.g. in the analysis of art. 520, but few such have been noticed. In conclusion, it may be said that in the opinion of the present writer the type of reader for whom the book is best adapted is the student preparing for a mathematical examination, such as the Cambridge Tripos, in which theory plays the principal part. It should also, however, prove a good book of reference to the physicist of superior mathematical attainments. For either of these types of readers it seems likely to be a really useful book, so far as its scope extends.

C. CHREE.

PETRELS.

A Monograph of the Petrels (order Tubinares).

Parts i., ii. and iii. By Dr. F. Du Cane Godman, F.R.S. With hand-coloured plates. (London: Witherby and Co., 1908.) Price 2l. 5s. per part.

WE welcome another instalment of the finely illustrated "monographs" in which ornithologists are gradually, if slowly, writing the history of the birds of the world. The latest of these monographs to be launched is founded on the synopsis of the order Tubinares, published by the late Mr. Salvin in the twenty-fifth volume of the "Catalogue of the Birds in the British Museum." It was Mr. Salvin's intention on the completion of that work to have issued a series of coloured illustrations representing all the species of petrels, shearwaters, fulmars, diving petrels, and albatrosses, which constitute the order Tubinares, and at the time of his death in 1897 many of the plates had been prepared. The present author has had the series of coloured plates completed, and he is now issuing them in the form of a monograph, adding such synonymy and accounts of the geographical distribution and habits of the species as Mr. Salvin originally intended, and bringing the work up to date.

Since the twenty-fifth volume of the British Museum Catalogue was issued in 1896, considerable additions to our knowledge of the Tubinares have been made. Some remarkable discoveries have been made by American ornithologists in the seas of California and the islands which lie off the south-western coast of North America, and Sir Walter Buller's supplement to the "Birds of New Zealand" has added to our knowledge of the group. Moreover, from the observations made by the naturalists to several recent Antarctic expeditions, we have learned a great deal about the breeding habits of certain well-known species, which, retiring to those inhospitable regions for the purpose of reproduction, had up to then managed to keep us very much in the dark as to the manner of their nesting. The material thus examined has enabled the author to undertake the revision of the Tubinares with some confidence. The order as at present known embraces more than one hundred species.

The first three parts of the work are now in our hands, and fully carry out so far as they go the objects set forth in the author's note. The first part deals with the smaller petrels of the following genera:—*Procellaria*, *Halocyptena*, *Oceanodroma*, *Oceanites*, *Gorrodia*, *Pelagodroma*, *Pealea*, and *Cymodroma* (in

part). First on the list comes our own familiar stormy petrel—the petrel *par excellence*—of which a very good and concise history is given, including synonymy, geographical distribution, breeding, and general life habits, and a full description of the plumage of the adult and young; and this is the general plan of the work.

Twenty-four species are treated of in sixty-eight pages of letterpress, and there are twenty coloured plates. Part ii. concludes *Cymodroma*, and deals with twenty-four species of the large genus *Puffinus*, the shearwaters, in sixty-four pages, with twenty coloured plates. In this part may be noticed the great shearwater, of which, though the bird was known to Latham so long ago as 1785, and although it sometimes appears in large numbers off our own coasts, the breeding place is still unknown. It can scarcely, however, be doubted that this must be sought for in southern latitudes, and in our winter.

Part iii. concludes *Puffinus*, and treats of four restricted genera and twenty-three species of the extensive genus *Æstrelata*. Among the former we find the silvery-grey fulmar of the southern oceans, which in general appearance so much resembles the fulmar of the north that Latham and Gmelin described it as a variety of that species. Also the great dark-coloured petrel familiarly known to sailors as the Cape Hen. The casual occurrences of *Æstrelata haesitata*, *Æ. brevipes*, and *Æ. neglecta* in the British Islands are wonderful instances of the wandering habits of these small fulmars. The accounts given of the breeding and general life habits of these ocean wanderers, the gliding flight of which has so often beguiled the monotonous hours of the passengers on liners, are very interesting; and those who often have occasion to go on long voyages (in the southern seas especially), and take an interest in the birds they see, would do well to study the plates, at all events, in this fine work, and so have a chance of learning (roughly speaking) the names of the petrels which may on some days be seen from the deck in great numbers. But specimens of these birds are very rarely secured, and no opportunity should be lost of preserving any that by a lucky chance should come into the traveller's hands; for some species are known from single specimens only, and others from but little more.

The work will be completed in five quarterly parts. It is beautifully printed on rag paper, and we need only say of the plates that they are by Mr. Keulemans, and drawn and coloured under the most careful supervision. This means that they are as near perfection as it is possible for ornithological plates to be.

O. V. A.

OUR BOOK SHELF.

Das Weltgebäude, Eine gemeinverständliche, Himmelskunde. By M. Wilhelm Meyer. Zweite, umgearbeitete Auflage. Pp. xii+691. (Leipzig and Vienna: Bibliographisches Institut, 1908.) Price 16 marks.

TEN years ago we read the first edition of this work with considerable satisfaction, and the examination of the second edition has been interesting, since it shows

how much astronomical science has advanced in the interval, and demonstrates the necessity of frequent revision of popular text-books of this character. In some respects the work has already fallen behind—inevitable from the time required to pass such a book through the press—and though an appendix is not a convenient form for supplying the most recent information, it might have been adopted here with advantage. If we may trust the index and a very careful scrutiny of the text, there is no reference to the eighth satellite of Jupiter. On the same grounds we think that justice has not been done to the energy and success with which Prof. Hale has pursued his investigations, and the references to Sir David Gill are meagre. Altogether the revision does not seem to have been made with sufficient thoroughness; there has been too great a reluctance to sacrifice the material prepared for the earlier edition, with the result that the author has retained references to earlier work which has been superseded by the employment of larger means and greater experience. But though one may regret that in some particulars the work might be improved, it still possesses very high claims to consideration. The main facts are presented in an admirably attractive manner, leaning perhaps, where opportunity offers, to the sensational side; but nevertheless the description is trustworthy, likely to captivate the amateur, and gain recruits to the study of astronomy.

The book is divided into two parts, the first devoted to purely descriptive astronomy, the other to explaining the motion of the heavenly bodies. In the first part, after an introduction explaining the optical principles of the telescope and its application to photography and spectrum analysis, we have a series of chapters describing the several members of the solar system, including comets and meteors, and finally the sun itself. Next follows a description of the stellar universe, separate chapters being assigned to the classification of stellar spectra; the nebulae and star clusters; the Milky Way; double and variable stars. In this section the author's task is comparatively simple. No material fact must be omitted; but in the second part, that treating of motion, he has to exercise selection, both of the subject itself and its method of treatment. Mathematical completeness is impossible, and therefore the chapters on planetary motion, solar parallax, aberration and precession, are scarcely satisfactory. But readers for whom the book is intended will no doubt find the treatment adequate, and those who desire a more thorough discussion would not look for it here.

Practical Coal Mining. By Leading Experts in Mining and Engineering. Edited by W. S. Boulton. Divisional-volume v. Pp. viii+176. (London: The Gresham Publishing Company, n.d.) Price 6s. net.

IN NATURE of May 23, 1907, and of March 19, 1908, notices were published of previous instalments of this work, which, when completed in six volumes, is intended to cover the whole ground of modern coal-mining practice. Each section of the work is written by a different author, a division of responsibility that renders a certain want of harmony in the treatment of the subject-matter inevitable. This defect is less noticeable in the present volume than in the four preceding volumes. Mr. James Ashworth's contribution on lighting covers 56 pages, with 125 excellent illustrations, and gives a concise review of the history of the safety lamp, and of the safety lamps in use at the present day. The importance of lamp housing is urged, and useful rules are given for the use of safety lamps. Mr. W. Galloway devotes 70 pages with 30 illustrations to a masterly essay on colliery explosions and rescue appliances. This contribution is also issued separately by the publishers. The subjects of fire damp,

blasting, coal dust and rescue appliances are fully discussed. Mr. Galloway's new departure in the method of explaining great colliery explosions whereby coal-dust is elevated to the rank of principal agent was received unfavourably and long rejected by many as illusory. Now, even the French engineers, after the Courrières explosion, have come into line with those of other countries, after having strenuously opposed the so-called coal-dust theory for thirty years. Mr. H. F. Bulman gives a brief account of mineral holdings, covering 20 pages. Lastly, there is the beginning of what promises to be a most useful section on mine surveying by Mr. L. H. Cooke.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Photographs of Comet *c* 1908 at the Royal Observatory, Greenwich.

LONG-EXPOSURE photographs of comet *c* 1908 have been obtained with the 30-inch reflector on September 6, 7, 8, 14, 17, 18, 21, 25, and 26, the exposure ranging from forty-five minutes to an hour (except on September 14 and 25, when exposures of twenty minutes were made). The comet possesses a bright tail, the structure of which is well shown in the photographs, to a distance of $1\frac{1}{2}^\circ$ from the head. The appearance of the tail changes greatly from night to night, so that photographs taken at much shorter intervals than a day are desirable in order to trace the alterations in structure continuously. With this in view, on September 17 three photographs, with exposures of forty-five minutes, were taken at intervals of approximately an hour (reckoned from the middle of each exposure); decided change had occurred between the first and last photographs, and the middle photograph served to show how the transition had taken place. Efforts are being made to obtain a series of photographs at short intervals extending throughout a night, but so far the full moon and the weather have prevented this.

A photograph taken on September 21 with a portrait lens of 11 inches focus showed the tail extending to a length of 4° . W. H. M. CHRISTIE.

Royal Observatory, Greenwich, September 28.

Library Cooperation in Regard to Scientific Serials.

ABOUT two years and a half ago a short paper of mine on "Library Aids to Mathematical Research" was fortunate enough to attract a little passing attention, the object of it being to bring about friendly cooperation among the public libraries of a city or district with a view to prevent waste in the purchase of duplicates, and thereby to make a greater number of serials accessible to research students. Of course, it was intended that this cooperation should be accompanied by the publication of a hand-list giving the names of the serials, and showing workers in what libraries any given serial was certain to be found. In NATURE in particular the matter received sympathetic consideration (see vol. lxxiii., pp. 372, 413, 438, 464, 513), and from the eminence of the correspondents hopes were raised that something practically valuable would be the outcome.

In the matter of *voluntary cooperation* among the libraries, exceedingly little would seem to have been effected, and the place where the need is greatest, London, appears to be as far off as ever from possessing a reference-library in which could be consulted the whole of the literature indexed in the Royal Society's Catalogue of Scientific Papers and in the International Catalogue.

As regards the production of a *hand-list of serials*, however, a most important step has been taken, the Royal Society having decided to preface each volume of its great subject-index with such a hand-list, and having actually carried out its decision in the case of the first volume. In this volume, which has recently appeared, and in which the pure mathematics of the nineteenth century is the